PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
03/281/EST		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/IT 03/00236	15.04.2003	21.05.2002

International Patent Classification (IPC) or both national classification and IPC

B21D43/02, B21D43/02

Applicant

PRODUTECH S.R.L. et al.

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
07.11.2003	19.02.2004

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IT 03/00236

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-7 as originally filed

Claims, Numbers

1-17 received on 02.02.2004 with letter of 29.01.2004

Drawings, Sheets

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☐ the claims, Nos.:

   ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-17
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-17
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-17
	No:	Claims	

2. Citations and explanations

   see separate sheet

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

The nearest prior art for the subject-matter of claim 1 is described in JP-A-60141342.

Inventive step:
The machining heads are driven parallel to the beams and transversely to the sheet metal feeding direction.

Problem to be solved / Advantage of the invention:
By these features the processing of sheet metal elements in coil form at high speed can be achieved.

Hence, claim 1 meets the requirements of Art. 33 PCT.
The dependent claims 2-17 describe preferred embodiments of the invention and therefore they also meet the requirements of Art. 33 PCT.

CLAIMS

1. An apparatus for cutting and nibbling sheet metal elements in coil form, characterized in that said apparatus comprises pulling devices for pulling said sheet metal elements, which are delivered from a coil or bobbin and are driven by a pair of overlapped rollers (1) and (2), (1') and (2') and (1") and (2"), and that said sheet metal element is adapted to be intermittently moved, stopped and moved backward, said sheet metal element being machined by a machining heads (15) and (16) which are arranged above and under said sheet metal element and can be transversely driven with respect to the feeding direction of said sheet metal element.

2. An apparatus, according to Claim 1, characterized in that said apparatus (10) further comprises a plurality of offset rollers performing a series of folding and counter-folding operations for providing said sheet metal element in a perfectly flat condition.

3. An apparatus, according to one or more of the preceding claims, characterized in that said sheet metal element is continuously fed, with intermittent feeding steps, stopping steps and backward moving steps.

4. An apparatus, according to one or more of the preceding claims, characterized in that said apparatus further comprises beams (11) and (12) supporting cross guide elements (13) and (14), parallel to said beams, and in turn supporting said movable machining heads (15) and (16).

5. An apparatus, according to one or more of the preceding claims, characterized in that said machining heads are driven parallel to said beams and transversely of the sheet metal element feeding direction.

6. An apparatus, according to one or more of the preceding claims, characterized in that said machining heads (15) and (16) can rotate about a machining axis which in turn can be transversely driven.

7. An apparatus, according to one or more of the preceding claims, characterized in that said machining heads (15) and (16) comprises a plurality of circularly arranged punch elements (36) cooperating with corresponding die elements applied to said bottom head (16).

8. An apparatus, according to one or more of the preceding claims, characterized in that said machining heads (15) and (16) are rotatively driven by brushless motors (17) and (18).

9. An apparatus, according to one or more of the preceding claims, characterized in that said apparatus further comprises a geared motor unit (19), said geared motor unit (19) having a shaft (19') supporting a toothed pulley (20) entraining a toothed belt (21).

10. An apparatus, according to one or more of the preceding claims, characterized in that said toothed belt rotatively drives a second toothed pulley (22), keyed on a supporting shaft (23).

11. An apparatus, according to one or more of the preceding claims, characterized in that said

shaft (23) longitudinally drives said sheet metal element, by driving the driving roller pair (1), (2) the rollers of which are coupled with the other pairs (1'), (2') and (1"), (2") of feeding and driving rollers.

12. An apparatus, according to one or more of the preceding claims, characterized in that said apparatus comprises a brushless motor assembly (25) having a toothed pulley (26) which entrains a toothed belt (27) in turn rotatively driving a toothed pulley (28) keyed on a worm screw (29).

13. An apparatus, according to one or more of the preceding claims, characterized in that said worm screw (29) engages with a scroll element (30) which operatively drives a top punch bearing head (15) so as to cause said head (15) to be translated along its guide elements (13).

14. An apparatus, according to one or more of the preceding claims, characterized in that said screw (29) cooperates with a second scroll element (31) which operatively drives said die bearing bottom head (16).

15. An apparatus, according to one or more of the preceding claims, characterized in that said apparatus further comprises a hydraulic cylinder (32) which vertically drives a wing (33) having, at a bottom portion thereof, an eccentric lug (34), and selectively pressing a radially arranged punch against a corresponding die element therefor.

16. An apparatus, according to one or more of the preceding claims, characterized in that said wing element (33) can freely rotate, as rotatively

driven by said machining head (15).

17. An apparatus, according to one or more of the preceding claims, characterized in that said wing element (33), as it is lowered, engages said eccentric lug (34) in a cavity corresponding to a punch element (36) to be operated.

18. An apparatus, according to one or more of the preceding claims, characterized in that said wing element (33) and the eccentric lug (34) thereof, engaging with a said punch element (36) are rotatively driven by the rotary movement of a said machining head.

19. An apparatus, according to one or more of the preceding claims, characterized in that the movements of said metal sheet element and said machining heads are controlled and timed by a numeric controlling center unit.

20. An apparatus, according to one or more of the preceding claims, characterized in that said apparatus can be used for performing like operations, by processing different materials, supplied in coil or sheet form, and comprising wood materials, plywood panel materials, multi-layer wood materials, plastics material panels or differently combined and/or aggregated materials, and as broadly disclosed and illustrated in the preceding disclosure and in the figures of the drawings accompanying the subject Industrial Invention Patent Application.